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ORIGINAL ARTICLE

Early retirement and the financial assets of individuals with back problems

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Abstract This paper quantifies the relationship between early retirement due to back problems and wealth, and contributes to a more complete picture of the full costs associated with back problems. The output data set of the microsimulation model Health&WealthMOD was analysed. Health&WealthMOD was specifically designed to measure the economic impacts of ill health on Australian workers aged 45–64 years. People aged 45–64 years who are out of the labour force due to back problems have significantly less chance of having any accumulated wealth. While almost all individuals who are in full-time employment with no chronic health condition have some wealth accumulated, a significantly smaller proportion (89%) of those who have retired early due to back problems do. Of those who have retired early due to back problems who do have some wealth, on average the total value of this wealth is 87% less (95% CI: −90 to −84%) than the total value of wealth accumulated by those who have remained in full-time employment with no health condition controlling for age, sex and education. The financial burden placed on those retiring early due to back problems is likely to cause financial stress in the future, as not only have retired individuals lost an income stream from paid employment, but they also have little or no wealth to draw upon. Preventing early retirement due to back problems will increase the time individuals will have to amass savings to finance their retirement and to protect against financial shocks.

Keywords Economic impact · Early retirement · Ageing · Labour force participation

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Introduction

Back problems are recognised as one of the most common health complaints in industrialised countries [1]. Numerous studies within Europe have estimated the lifetime incidence rate, with most concluding that 60–80% of people will experience back problems at some stage in their lives [2–4]. In addition to these high incidence rates, back pain places a large economic burden on society. van Tulder et al. [5], who looked at the costs of back problems and musculoskeletal disorders in the Netherlands, concluded that back problems are "not only a major medical problem but also a major economical problem".

Within Australia, back problems are also a major source of the burden of disease and place a large financial burden on society. It has been estimated that back problems usually affect between 15 and 30% of a population at any one time, with Australia falling within these estimates [6]. Back problems are the most expensive of any musculoskeletal condition in Australia, costing an estimated $1.02 billion in 2002 (around 561 million EUR) [7], an occurrence that is also reflected internationally [5]. Both the incidence and cost of back problems are higher for older workers. Back

problems cost $31.7 million (17.44EUR) in workers compensation claims by older workers in New South Wales, the most populous state in Australia (in 2003/2004) [8].

Numerous reports have indicated that the indirect costs of back pain are much larger than the direct medical and compensation costs [7, 9]. Most of the studies undertaken in Australia and Europe have attributed most of these indirect costs to the work absenteeism caused by back problems [1, 5, 7, 9–14]. Extreme back pain can lead to early retirement, and 41.4% of Australians aged 45–64 years who identify back pain as their main health problem are not in the workforce [15]. The costs of lost income, lost taxes and increased benefit payments as a result of early retirement due to back pain are also significant. Those aged 45–64 years and out of the labour force due to back problems have lower weekly incomes, receive more in transfer payments and pay less tax than those with no health condition [16].

While these costs of back pain are substantial, there may be further costs as a result of early retirement that impacts over a lifetime. Individuals who retire early due to back problems may accumulate less wealth. Losing savings capacity in the 45–64 years period is particularly significant, as it is during this stage of the life cycle that most of the lifetime savings and wealth accumulation occur [17]. Savings at this time are often targeted at financing future retirement and, with increasing life expectancy, may have to support a longer period of time [18–20]. Back problems that result in early retirement may leave an increasing number of individuals with reduced accumulated wealth with which to finance their retirement.

This paper will explore the relationship between having back problems and wealth accumulation in Australia, and will contribute to a more complete picture of the full costs associated with early retirement due to back problems. It is thought that these results will have relevance for most European countries where back problems impacts a similar proportion of the population, and also has significant indirect costs due to work absenteeism caused by back problems. The paper will quantify the lost savings due to early retirement as a result of back problems, using Australians aged 45–64 years as a case example.

Materials and methods

Data

For this study, the output data set of the microsimulation model Health&WealthMOD was analysed. Health&Wealth MOD is Australia's first microsimulation model of health and its associated impacts on labour force participation, personal income and wealth, and government revenue. It was specifically designed to measure the economic impacts of ill health on Australian workers aged 45–64 years. Health&WealthMOD was built on the unit record data of the 2003 Survey of Disability, Ageing and Carers conducted by the Australian Bureau of Statistics [21] and the output data of a microsimulation model of income and wealth, STINMOD, developed by the National Centre for Social and Economic Modelling for the Australian Government [22].

The survey of disability, ageing and carers—a nationally representative survey conducted by the Australian Bureau of Statistics—provides detailed self-reported data on socio-demographic status, labour force participation and health and disability status (such as chronic conditions) for each individual in Health&WealthMOD. Respondent's chronic or 'long-term' health conditions[1] were classified by the Australian Bureau of Statistics using ICD10 codes. People who reported "back problems (dorsopathies)" as their main chronic health condition were considered to have 'back problems' (ICD10 codes M40-54). People who were out of the labour force due to ill health and identified back problems as their main health condition are considered to be out of the labour force due to back problems in this study.

Economic information such as income and wealth were imputed from STINMOD. The imputation was carried out by synthetically matching [23] a person's records with similar socio-demographic and labour force participation characteristics in the two data sets. Synthetic matching was based on nine matching variables that were common to both data sets and strongly related to income: sex, income unit type, type of government pension/support, income quintile, age group, labour force status, hours worked per week, highest educational qualification and home ownership. The data were reweighted to represent the 2009 population and up-rated to reflect the demographic, labour force, income and wealth, and other changes that had occurred between 2003 and 2009. The development of Health&WealthMOD is explained in more detail in Schofield et al. [24, 25]. All figures are represented in 2009 Australia dollars and their 2009 Euro equivalent provided (1 Australian dollar = approximately 0.55 Euros in 2009. In 2009, the purchasing power parity (PPP) was 1.46 for Australia and 0.803 for Euro areas, and 0.752 for the European Union, with that in USA being 1. PPP represented the number of monetary units to buy the same representative basket of consumer goods and services [26]).

[1] The conditions had lasted, or were likely to last, for six months or longer 23. Australian Bureau of Statistics, *Information Paper—Disability, Ageing and Carers, Australia: User Guide ABS 4431.0.55.001*. 2003, ABS: Canberra.

Statistical methods

Two different classes of wealth were analysed: income producing assets (cash, superannuation, shares and property investment other than the respondents' owner-occupied home) and non-income producing assets (value of owner-occupied home), as well as the total value of an individual's wealth, which was calculated as the sum of the above two wealth classes.

Logistic regression models were used to compare the odds of owning wealth by those who reported being out of the labour force due to back problems with those who were in full-time work and had no chronic condition. Analyses were separately conducted for the two different classes of wealth and total wealth and adjusted for age group, sex and highest education.

Amongst those with any wealth (value of combined wealth assets more than $0), descriptive analysis was undertaken to determine the mean and median value of wealth assets for each labour force type: those employed full time with no health condition, those employed part time with no health condition, and those not in the labour force due to back problems.

Multiple linear regression models of the log of the value of wealth were used to analyse the differences between the value of wealth held by people working full time with no chronic condition, persons working part time with no chronic condition, and people not in the labour force due to back problems. People working full time with no chronic condition was used as the reference group. Analyses were separately conducted for the two different classes of wealth and total wealth and adjusted for age group, sex and highest education.

Multiple regression analyses were undertaken on log-transformed data to satisfy the assumptions of linear regression analysis, and regression diagnostics confirmed that the assumptions were reasonably satisfied. To estimate the results for the entire Australian population in the 45–64 years age group, we performed weighted analysis using the weights that represented the number of individuals in the Australian population. All analyses were undertaken using SAS V9.2 (SAS Institute Inc., Cary, NC, USA). All statistical tests were two sided with the significance level set at 5%. All results are presented with their 95% confidence intervals.

Results

A total of 8,864 people living in private accommodations and aged between 45 and 64 years were surveyed in the Survey of Disability, Ageing and Carers. Of this sample, there were 147 individuals who were not in the labour force due to illness and identified back problems as their main health condition; 2,267 individuals were employed full time and 776 were employed part time with no long-term health condition. Once weighted, these individuals represented 106,895 individuals within the Australian population aged 45–64 years, who were out of the labour force due to back problems. A total of 1,407,268 individuals were employed full time and 417,937 individuals were employed part time with no health condition.

While almost all of the individuals aged 45–64 years who are in full-time employment with no chronic health condition have some wealth accumulated (99.8%), a significantly smaller proportion of those who have retired early due to back problems have accumulated any wealth (only 89%). These individuals who are out of the labour force due to back problems have significantly lower odds of having any accumulated wealth (OR 0.03, 95% CI 0.01–0.06) (Table 1). When looking at different asset classes, those who have retired early due to their back problems consistently have lower odds of having wealth than those in full-time employment with no chronic health condition (income producing assets OR 0.06, 95% CI 0.03–0.12; non-income producing assets OR 0.15, 95% CI 0.09–0.25). Only 59% of those who retired early due to their back problems have any equity in an owner-occupied property, which is far less than those employed full time with no health condition at 89% (Table 1).

Among people aged 45–64 years who retire early due to back problems and who have accumulated any wealth, the median value of total wealth is 54% of that of those who remain in full-time employment and have no health condition (Table 2). The value of income producing assets is only 10% and non-income producing assets 82% of that of those employed full time with no health condition.

When adjusted for age, sex and education, people aged 45–64 years old who are out of the labour force due to back problems have significantly less total wealth and income producing assets than those in full-time employment (Table 3). Of those who have retired early due to back problems, who do have some wealth, on average the total value of this wealth is 87% less (95% CI: −89.93 to −84.12) than the total value of the wealth of those who have remained in full-time employment with no health condition.

Discussion

This study has shown that people who retire from the labour force early due to their back problems have significantly less wealth accumulated than people of the same age, sex and education who have remained in the labour force with no health condition. This is likely to cause

Table 1 Odds of having any wealth by different classes of wealth, labour force participation and health status, Australians 45–64 years old, 2009, controlled for age, sex and education

Labour force status	N	Population with this asset type	*n*[a]	%[b]	OR (95% CI)	*P* value
Total wealth						
Employed full time, no condition	2,267	1,403,163	2,256	99.7	1	
Employed part time, no condition	776	417,098	774	99.8	1.30 (0.28–6.13)	0.738
Not in labour force due to back problems	147	95,212	133	89.1	0.03 (0.01–0.06)	<0.0001
Income producing assets						
Employed full time, no condition	2,267	1,403,163	2,228	98.5	1	
Employed part time, no condition	776	417,098	762	96.6	0.46 (0.22–0.96)	0.040
Not in labour force due to back problems	147	95,212	116	80.3	0.06 (0.03–0.12)	<0.0001
NON-income producing assets						
Employed full time, no condition	2,267	1,252,878	1,971	89.0	1	
Employed part time, no condition	776	389,209	709	93.1	1.53 (0.97–2.42)	0.066
Not in labour force due to back problems	147	63,271	90	59.2	0.15 (0.09–0.25)	<0.0001

[a] Number of people surveyed, who had assets

[b] Percentage of population with asset type

Table 2 Value of different types of wealth assets for Australians aged 45–64 years who are out of the labour force due to their back problems, and those who are in full-time and part-time employment with no health condition: for those who had any wealth

Labour force status	Mean AU$ (EUR)	SD	Median AU$ (EUR)
Total wealth			
Employed full time, no condition	398,098 (218,953)	490,038	255,199 (140,359)
Employed part time, no condition	360,071 (198,039)	405,432	225,652 (124,109)
Not in labour force due to back problems	204,759 (112,617)	286,354	138,147 (75,981)
Income producing assets			
Employed full time, no condition	213,201 (117,260)	357,369	100,316 (55,174)
Employed part time, no condition	175,871 (96,729)	300,987	50,556 (27,806)
Not in labour force due to back problems	108,906 (59,898)	221,287	9,852 (5,419)
Non-income producing assets			
Employed full time, no condition	209,867 (115,427)	219,829	153,695 (84,532)
Employed part time, no condition	203,365 (111,851)	182,070	149,308 (82,119)
Not in labour force due to back problems	160,413 (88,227)	94,862	126,108 (69,359)

financial stress in the future as those who retire from the labour force early due to back problems have not only lost an income stream from paid employment, but they have also little or no wealth to draw upon.

It is recognised internationally that back problems are a major source of disability and can lead to lost labour force participation due to both retirement and absenteeism [1, 9, 10, 27], with back problems keeping more Australians aged 45–64 years out of the workforce than any other condition [15]. Most of the studies that assess the indirect costs of back problems focus on the time lost to work absence as the main cost of back problems [1, 5, 9, 12, 13, 28]. This study adds to this international literature by quantifying the amount of wealth lost by individuals who have retired early due to back problems: a previously unexplored area on the costs of this condition.

This study has shown that workforce retirement has the additional cost of lower accumulated wealth. Among those individuals who retire early due to back problems who do have some wealth, the amount is significantly less than for those who remained in the workforce full time (indeed, the value of income producing assets is 92% less, and value of total assets is 87% less), reflecting the way workforce absence impacts on these individuals' economic resources and hence living standards.

The Australian health-care system and social security system provide a means-tested pension payment to those who have exited the workforce early, and this may to some

Table 3 Difference in value of wealth for those who were employed part time with no health condition, and those who were not in the labour force due to back problems, compared with those who were employed full time with no health condition, adjusted for age, sex and education

Labour force status	% Difference (95% CI)	*P* value
Total wealth		
Employed full time, no condition	0	
Employed part time, no condition	−9.46 (−20.39 to 2.76)	0.2762
Not in labour force due to back problems	−87.35 (−89.93 to −84.12)	<0.0001*
Income producing assets		
Employed full time, no condition	0	
Employed part time, no condition	−49.68 (−46.92 to −26.60)	<0.0001*
Not in labour force due to back problems	−92.29 (−94.29 to −89.60)	<0.0001*
Non-income producing assets		
Employed full time, no condition	0	
Employed part time, no condition	1.33 (−6.23 to 9.51)	0.7867
Not in labour force due to back problems	−14.47 (−26.17 to 0.44)	0.1483

extent help to protect persons with back problems from loss of all their savings and associated deterioration in living standards. However, this payment, the full rate of which is currently $658.40 per fortnight (362EUR) [29], will only provide an amount on which individuals can have basic living standards [30]. The wealth of those with back problems is still significantly compromised relative to those who are well. This study showed that if people out of the labour force due to back problems do have any wealth, on average they only have $204 759 (112 617 EUR), which is far lower than the amount held by those in full- and part-time employment with no health conditions [$398 098 (218 954 EU) and $360 071 (198 039 EUR), respectively].

Having accumulated wealth is vital for the financial security of individuals and their families, and a lower amount of accumulated wealth is likely to result in lower living standards for these individuals later in life. Accumulated wealth is typically used in retirement to finance both large financial commitments and also general daily consumption [31–33]. It also provides security against unexpected changes or events—such as deterioration of health—by providing a "buffer stock of wealth" [31, 32].

Preventing early retirement due to back problems will increase the time in which individuals have to amass savings to finance their retirement and to protect against financial shocks [18, 34]. These results have clearly shown that when individuals do retire early, thus reducing the time they have to save for retirement, they are less likely to have any wealth accumulated, or if they do, it is significantly less than those who are employed full time.

The proper management of back problems is seen as one way of overcoming the detrimental impacts that the condition has on individuals, their workforce participation and the associated costs, such as reduced wealth [14]. The findings of this study are consistent with the goals of the present Australian Labour government's health platform, which suggests that chronic disease prevention or management can increase labour force participation. This will ensure that future government revenue is sufficient to fund health care for an ageing population, and will assist in maintaining economic growth through providing human capital for production [35–38]. The role of the government will be seen to supply preventative health measures to ensure that ill health does not provide an impediment to workforce participation.

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